

## Publication

## Augmented reality assisted laparoscopic partial nephrectomy

**Book Item (Buchkapitel, Lexikonartikel, jur. Kommentierung, Beiträge in Sammelbänden)****ID** 2846055**Author(s)** Schneider, Adrian; Pezold, Simon; Sauer, Andreas; Ebbing, Jan; Wyler, Stephen; Rosenthal, Rachel; Cattin, Philippe C.**Author(s) at UniBasel** [Cattin, Philippe Claude](#) ;**Year** 2014**Title** Augmented reality assisted laparoscopic partial nephrectomy**Editor(s)** Golland, P; Hata, N; Barillot, C; Hornegger, J; Howe, R**Book title** Medical image computing and computer-assisted intervention – MICCAI 2014 : 17th International Conference, Boston, MA, USA, September 14-18, 2014 ; Proceedings**Volume** 2**Publisher** Springer**Place of publication** Cham**Pages** 357-364**ISSN/ISBN** 0302-9743 ; 1611-3349 ; 978-3-319-10469-0 ; 978-3-319-10470-6**Series title** Lecture Notes in Computer Science book series (LNCS)**Number** 8674**Mesh terms** Animals; Equipment Design; Equipment Failure Analysis; Image Interpretation, Computer-Assisted, methods; Kidney, surgery; Laparoscopes; Magnetics, instrumentation; Nephrectomy, instrumentation; Reproducibility of Results; Sensitivity and Specificity; Surgery, Computer-Assisted, instrumentation; Swine; User-Computer Interface

Computer assisted navigation is a widely adopted technique in neurosurgery and orthopedics. However, it is rarely used for surgeries on abdominal organs. In this paper, we propose a novel, non-invasive method based on electromagnetic tracking to determine the pose of the kidney. As a clinical use case, we show a complete surgical navigation system for augmented reality assisted laparoscopic partial nephrectomy. Experiments were performed ex vivo on pig kidneys and the evaluation showed an excellent augmented reality alignment error of 2.1 mm  $\pm$  1.2 mm.

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